

REMARKS

Claims 1-16 are pending in the application. Claims 13-15 are amended. No new matter is presented. The above amendments and the following remarks are considered by Applicants to overcome each objection and rejection raised by the Examiner and to place the application in condition for allowance. An early Notice of Allowance is therefore requested.

The drawings are objected to for failing to show three different alternating layer systems. Applicants respectfully disagree with the Examiner's position that the drawings fail to show the three different alternating layer systems. The systems are illustrated in Figures 7A, 7B, and 7C. Specifically, the drawings illustrate the refractive index over the layer thickness of the system. The patterns illustrated also depict the multi-layer systems having two alternating layer materials with exactly two different refractive indices and differing layer thickness. Thus, Figures 7A, 7B, and 7C illustrate the varying layer thicknesses with the number of layers counted from each direction (left to right, top to bottom). Therefore, is submitted that the drawings clearly illustrate the three different alternating layer systems. Accordingly, Applicants request the withdrawal of the objection to the drawings.

Claim 14 was objected for containing an informality. Claim 14 is amended to overcome this informality. Therefore, Applicants request the withdrawal of the objection to claim 14.

Claims 13-16 were rejected under 35 U.S.C. 112 for containing terms that do not have antecedent basis. Claims 13-15 are amended to more clearly recite the features of the claimed invention. These amendments are merely cosmetic in scope, therefore, do not affect the scope of the claims. No new matter is presented. Therefore, Applicants request the withdrawal of the rejection of claims 13-16 under 35 U.S.C. 112.

Claims 1, 2, and 6 were rejected under 35 U.S.C. 102(b) as being anticipated by Vincent (U.S. Patent No. 5,272,518). The Examiner takes the position that Vincent discloses all the features recited in claims 1, 2, and 6. Applicants respectfully disagree.

Vincent is directed to an apparatus for monitoring, converting, and calibrating the spectra displayed by a colored object, using wavelength dispersion provided by a variable wavelength filter. More specifically, Vincent discloses an apparatus that provides a variable

wavelength light filter which disperses the beam into a plurality of wavelengths that increase monotonically with position x or a selected direction in the light-receiving surface. Thus, the light filter either reflects the dispersed light beam or transmits the dispersed light beam through the filter. As a result, for any position x , the light filter is confined to a very narrow wavelength pass band with no side bands being transmitted at that position x . (See Column 6, Lines 25-40).

In other words, the light filter disclosed by Vincent is merely a wedge filter whose thickness varies linearly or non-linearly with a spatial coordinate X (See Figure 8). The filter is a narrow band transmission filter and the wavelength of transmission is a function of the layer thickness of the interference material. Due to the increasing thickness of the wedge, the center wavelength of the beam transmitted changes depending on the position of the beam. Accordingly, at one end of the wedge only blue light is transmitted while on the other side only red colored light passed through. The colors cyan, green, and yellow light are transmitted at a position between the two ends. Therefore, the incident light is dispersed into a spread spectrum and is measured at different linear positions. Thus, Vincent discloses more than three spectrally separated partial sensor surfaces and spectrally spread color values for deterring the color of the object.

In addition, Vincent does not disclose three alternating layer systems around an axis. Vincent merely discloses additional filtering through combinations of broad band pass filters, absorption filters, or different order Fabry-Perot type filters. As a result, this combination of filters requires the coating of one or both sides of the substrate planes. In other words, Vincent merely discloses the combination of filters to provide a overlapping of effects produced by the different types of filters. As a result, Vincent does not provide a compact sensor in which three sensor parts are combined with an interference filter system which provides defined transmission characteristics for only three basic colors of a standardized color space, wherein the transmission characteristics correspond to the color sensitivity functions of the human eye for those basic colors.

Furthermore, Applicants disagree with the Examiner interpretation that the partial surfaces disclosed by Vincent would provide three measurement values in response with the

selectively transmitted incident light (Column 8, Lines 45-55). Since Vincent utilizes narrow band pass filtering and a plurality of sensor elements and as a result the spreads the incident light into a plurality of spectral parts, it is necessary to convolve the measurement values into coordinates of a color space. In contrast, the claimed invention provides the coordinates of the color space in the sensor itself. As a result, the measurement values do not need to be convoluted to generate coordinates for the color space.

In view of these distinctions, it is respectfully submitted that Vincent fails to teach or suggest a sensor chip having at least three partial surfaces of different sensitivities for detecting the three spectral components through said interference filter structure which precedes said sensor chip partial surfaces. Vincent also fails to teach or suggest an interference filter having a transmission characteristic over the wavelength of the light to be measured spectrally being adapted to the response of the human eye in such a way that the product of the base sensitivity of the photosensor and the transmission of the interference filter is proportional to the normal spectral value curve of the human eye for the relevant coordinate of the color space, so that the passed spectral components generate measurement values in the partial surfaces, which measurement values can be scaled into spectral color values. Therefore, Applicants respectfully submit that Vincent fails to teach or suggest all the features recited in claim 1. Accordingly, Applicants request the withdrawal of the rejection of claim 1 under 35 U.S.C. 102(b).

Claims 2 and 6 are dependent upon claim 1. It is submitted that claims 2 and 6 recite patentable subject matter for at least the reasons mentioned above. It is also submitted that Vincent fails to teach or suggest the features of the claimed invention as recited in claim 2. Specifically, Vincent does not teach or suggest the transmission characteristic for each partial surface of the sensor chip having different sensitivities is produced as a computer-simulated alternating layer system with different layer thicknesses of TiO_2 and SiO_2 with a tolerance of the layer thicknesses of at most 2%. The Examiner states that since the limitation of claim 2 adds no structural difference, Vincent inherently discloses the limitation. Applicants respectfully disagree. The composition of layer thickness according to the invention differs from each layer since each layer may have a different thickness. As a result, there is a

structural difference in the claimed invention which has an effect on the transmission characteristics. Therefore, since Vincent fails to teach or suggest this feature, Applicants request the withdrawal of the rejection of claim 2 under 35 U.S.C. 102(b).

With regard to claim 6, Applicant respectfully submits that Vincent fails to teach or suggest interference filters arranged directly on the semiconductor diodes of the sensor chip. Vincent discloses that filter and sensor may be coupled optically through a fiber face plate. Thus, Vincent merely discloses minimizing the space between the sensor and filter. This is not the same as having the interference filters positioned directly on the semiconductor diodes of the sensor chip. Therefore, it is submitted that Vincent fails to teach or suggest the feature recited in claim 6. Accordingly, Applicants request the withdrawal of the rejection of claims 2 and 6 under 35 U.S.C. 102(b).

Claims 3-5 were rejected under 35 U.S.C. 103(a) as being unpatentable over Vincent in view of Delignieres (U.S. Patent No. 5,680,220). The Examiner takes the position that the combination of Vincent and Delignieres teaches or suggests all the features recited in claims 3-5. Applicants respectfully disagree.

Delignieres discloses a linear correction method, however, Delignieres fails to cure the deficiencies of Vincent. Since claims 3-5 are dependent upon claim 1, it is submitted that for at least the reasons mentioned above, claims 3-5 recite patentable subject matter. Accordingly, Applicants requests the withdrawal of the rejection of claims 2-7 under 35 U.S.C. 103(a).

Claims 7-9, 12, 13, and 15 were rejected under 35 U.S.C. 103(a) as being unpatentable over Vincent. Applicants respectfully traverse the rejection of claims 7-9, 12, 13, and 15.

Claims 7-9, 12, 13, and 15 are dependent upon claim 1. Therefore, it is submitted that for at least the reasons mentioned above, claims 7-9, 12, 13, and 15 recite patentable subject matter. Also Accordingly, Applicants requests the withdrawal of the rejection of claims 7-9, 12, 13, and 15 under 35 U.S.C. 103(a).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vincent in view of Auth (U.S. Patent Re. 32,821). Applicants respectfully submit that the combination of Vincent and Auth fail to teach or suggest all the features recited in claim 10.

Auth is directed to an apparatus and method for photoluminescence analysis. Auth also discloses the use of a germanium photo-diode.

Although Auth discloses a germanium photo-diode, Auth fails to cure the deficiencies of Vincent as discussed above. Claim 10 is dependent upon claim 1. Therefore, it is submitted that for at least the reasons mentioned above, claim 10 recites patentable subject matter. Accordingly, Applicants requests the withdrawal of the rejection of claim 10 under 35 U.S.C. 103(a).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vincent in view of Turner (U.S. Patent No. 6,707,556). The Examiner takes the position that the combination of Vincent and Turner teach or suggest all the features recited in claim 11. Applicants respectfully disagree.

Claim 11 is dependent upon claim 1. Although Tuner discloses InGaAs diodes, Turner does not cure the deficiencies of Vincent. Therefore, it is submitted that for at least the reasons mentioned above, claim 11 recites patentable subject matter. Accordingly, Applicants requests the withdrawal of the rejection of claim 11 under 35 U.S.C. 103(a).

Claims 1-3, and 6 were rejected under 35 U.S.C. 103(a) as being unpatentable over Jie (U.S. Patent No. 6,133,954) in view of Hanrahan (U.S. Patent No. 5,246,803). The Examiner takes the position that the combination of Jie and Hanrahan teach or suggest all the features recited in claims 1-3, and 6. Applicants respectfully disagree.

Jie is directed to a single integrated-circuit color camera chip that includes color sensitive triplets of light detecting cells for different colors. However, the triplets are not arranged in a position directly adjacent but aligned in rows and lines of the integrated-circuit chip with gaps in between. Also, there is no teaching or suggestion in Jie of 120 degree rotated arrangements of the sensor parts according to the claimed invention. Moreover, each light-detecting cell is associated with a color filter of a different color. As a result, each cell has a band pass absorption filter. In contrast, in the claimed invention, each of the three interference filters has a characteristic filter function that is adapted to the color sensitivity of the human eye normalized to the same standardized color space.

Hanrahan discloses the forming of color filters by vacuum depositing alternating layers of SiO₂ and TiO₂.

Although Hanrahan discloses the use of silicon oxide and titanium oxide, Hanrahan does not cure the deficiency of Jie. In particular, the combination of Jie and Hanrahan fail to teach or suggest each interference filter having a transmission characteristic over the wavelength of the light to be measured spectrally being adapted to the response of the human

eye in such a way that the product of the base sensitivity of the photosensor and the transmission of the interference filter is proportional to the normal spectral value curve of the human eye for the relevant coordinate of the color space, so that the passed spectral components generate measurement values in the partial surfaces, which measurement values can be scaled into spectral color values. Therefore, Applicants request the withdrawal of the rejection of claims 1 under 35 U.S.C. 103(a).

Claim 2, 3, and 6 are dependent upon claim 1. It is submitted that claims 2, 3, and 6 recite patentable subject matter for at least the reasons mentioned above. Therefore, Applicants request the withdrawal of the rejection of claims 2, 3, and 6 under 35 U.S.C. 103(a).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jie in view of Hanrahan and further in view of Delignieres. Applicants respectfully traverse the rejection of claim 3.

Claim 3 is dependent upon claim 1. It is respectfully submitted that neither Hanrahan nor Delignieres either in combination or alone cure the deficiencies of Jie. As a result, it is submitted that claim 3 recites patentable subject matter for at least the reasons mentioned above. Therefore, Applicants request the withdrawal of the rejection of claim 3 under 35 U.S.C. 103(a).

Claims 7-9 and 12 were rejected under 35 U.S.C. 103(a) as being unpatentable over Jie in view of Hanrahan. Applicants traverse the rejection of claims 7-9 and 12.

Claims 7-9 and 12 are dependent upon claim 1. Therefore, it is submitted that for at least the reasons mentioned above, claims 7-9, and 12 recite patentable subject matter. Accordingly, Applicants request the withdrawal of the rejection of claims 7-9 and 12 under 35 U.S.C. 103(a).

Claims 13, 15, and 16 were rejected under 35 U.S.C. 103(a) as being unpatentable over Jie in view of Hanrahan in view of Mathies (U.S. Patent No. 6,867,420). Applicants traverse the rejection of claims 13, 15, and 16.

Claims 13, 15, and 16 are dependent upon claim 1. Therefore, it is submitted that for at least the reasons mentioned above, claims 13, 15, and 16 recite patentable subject matter. Accordingly, Applicants request the withdrawal of the rejection of claims 13, 15, and 16 under 35 U.S.C. 103(a).

Claim 10 was rejected under 35 U.S.C. 103(a) as being unpatentable over Jie in view of Hanrahan in view of Auth. Applicants respectfully traverse the rejection of claim 10.

Claim 10 is dependent upon claim 1. Since Auth fails to cure the deficiencies of Jie and Hanrahan, it is submitted that for at least the reasons mentioned above, claim 10 recites

patentable subject matter. Accordingly, Applicants requests the withdrawal of the rejection of claim 10 under 35 U.S.C. 103(a).

Claim 11 was rejected under 35 U.S.C. 103(a) as being unpatentable over Jie in view of Hanrahan in view of Turner. Applicants respectfully traverse the rejection of claims 11.

Claim 11 is dependent upon claim 1. It is submitted that since Turner fails to cure the deficiencies of Jie and Hanrahan claim 11 recites patentable subject matter, for at least the reasons mentioned above. Accordingly, Applicants requests the withdrawal of the rejection of claim 10 under 35 U.S.C. 103(a).

In view of the above amendments and remarks, Applicants submit claims 1-16 recite subject matter that is neither taught nor suggested by the applied references. Thus, for the reasons presented above, claims 1-16 are believed by Applicants to define patentable subject matter and should be passed to issue at the earliest possible time. A Notice of Allowance is requested.

Respectfully submitted,



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